Flood Insurance Study. City of Poquoson, Virginia, Independent City

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FLOOD INSURANCE STUDY

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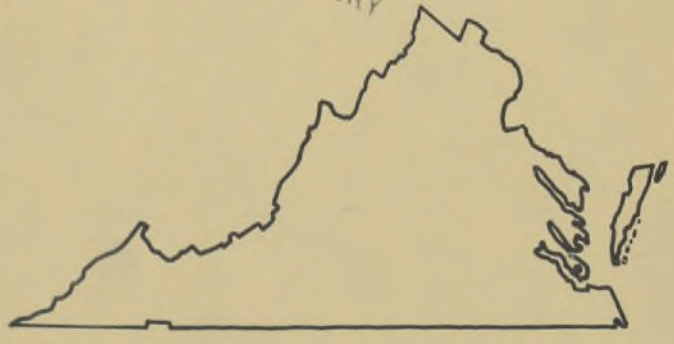

NOVEMBER 1976

U.S. DEPARTMENT of HOUSING & URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

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FLOOD INSURANCE STUDY
CITY OF POQUOSON, VIRGINIA

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the City of Poquoson, Virginia, and to aid in the administration of the Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert Poquoson to the regular program of flood insurance by the Federal Insurance Administration. Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

A search for basic data was made at all levels of Government. No local, state, or other Federal agencies are involved in flood studies regarding the City of Poquoson at the present time.

Several meetings were held during the preparation of this study with representatives of the Federal Insurance Administration, U. S. Army Corps of Engineers, Virginia State Water Control Board and local officials. Contacts with various agencies were made during this study in order to minimize possible hydraulic and hydrological conflicts.

Through the assistance and cooperation of the United States Geological Survey, National Weather Service, C. K. Tudor Engineers, Newport News, Virginia, "The Times-Herald," Newport News-Hampton, Virginia, and private citizens, useful data for the preparation of this study were supplied.

A final consultation-coordination meeting was held for the City of Poquoson on April 2, 1976. Presentation of the Flood Insurance Study was made by the Regional Office Staff and the Project Contractor (U. S. Army Corps of Engineers). General satisfaction with the study was expressed by the City representatives.

1.3 Authorization and Financing

This Flood Insurance Study was conducted by the United States Army Corps of Engineers, Norfolk District, at the request of the Federal

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Insurance Administration, United States Department of Housing and Urban Development. The source of authority for the study is the National Flood Insurance Act of 1968, as amended. Authority and financing are contained in Interagency Agreement Numbers H-16-75, Project Order No. 16 and H-7-76, Project Order No. 1.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the City of Poquoson, Virginia, located on the eastern tip of York County in an area known as the Lower Peninsula of Virginia, a peninsula separating the York and James Rivers. The City is bounded by the Chesapeake Bay on the east and Back Rivers respectively. Excluded from the study area is the Plum Tree Island National Wildlife Refuge. The area of study is shown on the Vicinity Map (Figure 1).

This report covers the effects of tidal flooding including high-velocity wave action on the Chesapeake Bay, which accompanies severe storms such as hurricanes and northeasters.

2.2 Community Description

The City of Poquoson is located near the southeastern portion of York County with the Poquoson River on the northern coast, Back River on the southern coast and the Chesapeake Bay forming the City's eastern coast in Virginia.

Poquoson became a Town by referendum in 1952 and a City in July 1975. Poquoson encompasses an area of 29-1/2 square miles and had a population of 5,441 in 1970. The seafood industry was the principle source of employment until recent years. Most people in the area now work in the Newport-News Shipyard, NASA, Langley Air Force Base, and in many industries located on the Lower Peninsula.

The climate of Poquoson is characterized by moderately warm summers with temperatures averaging about 78 degrees during July, the warmest month. The winters are cool with temperatures averaging about

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FIGURE 1

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF POQUOSON, VA
(INDEPENDENT CITY)

APPROXIMATE SCALE
0 5 10 15 20 MILES

VICINITY MAP

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41 degrees in January, the coolest month. Annual precipitation, over the area averages about 43 inches. Snowfall is infrequent, generally occurring in light falls which normally melt and disappear within 24 hours.

The topography of the Poquoson area is typical of the lower Tidewater area bounding the Chesapeake Bay and Hampton Roads Harbor. The terrain of the area is generally flat and featureless. There are numerous inlets, marshes, and creeks forming the many peninsulas of development. Land elevations in many of these developed areas seldom exceed five feet above mean sea level. The major portion of the City of Poquoson is less than seven feet above mean sea level. There are no protective barriers such as sand dunes or continuous seawalls between the developed portions of the City and the surrounding waters.

The City of Poquoson is bounded on the north by the Poquoson River, east by the Chesapeake Bay, south by the Back River and Northwest Branch Back River, and west by Lamb Creek and York County. Fluctuations in the surrounding water levels of approximately one and a half feet below mean sea level occur twice daily as a result of the normal astronomical tide. The timing or coincidence of maximum surge producing forces with the normal high tide is an important factor in the consideration of flooding from tidal sources.

2.3 Principal Flood Problems

Two general types of storms affect the City of Poquoson, and they are hurricanes and northeasters. Hurricanes are the most severe storms to which the study area is subjected. A study of tracks of all tropical storms for which there is a record indicates that once a year on an average, a tropical storm of hurricane force passes within 250 miles of the area, and poses a threat to Poquoson. While hurricanes may affect the area from May through November, nearly 80 percent occur in the months of August, September, and October with about 40 percent occurring in September. The most severe hurricane to strike the study area occurred in August 1933. Other notable hurricanes of recent occurrence which caused significant flooding in Poquoson were those of September 1933, September 1936 and September 1960.

"Northeaster" is a term used to identify a storm with strong onshore winds from the northeast direction. These storms originate, with little or no warning, along the middle and northern Atlantic coast. These storms occur most frequently in the winter months but may occur

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at any time. Accompanying winds are not of hurricane force but are persistent, causing above-normal tides for long periods of time. The March 1962 northeaster was the worst to ever hit the study area.

The depth of flooding during these storms depends upon the velocity, direction and duration of the wind and the astronomical tide. The duration of flooding depends upon the duration of the tide-producing forces. Floods caused by a hurricane are usually of much shorter duration than the ones caused by a "northeaster." Flooding from hurricanes rarely last more than one tidal cycle; whereas, flooding caused by northeast storms may last several days, during which the most severe flooding takes place at the time of the peak astronomical tide.

The shoreline of Poquoson is also affected by wave action during large tidal floods, resulting in erosion, damage to boats, equipment, and shore-front structures. Waves are generated by the action of wind on the surface of the water. Wave heights at any given location are dependent upon the velocity, direction, and duration of the wind; and the length, width, and depth of water over which the wind is acting.

Poquoson has experienced major storms since the early settlement of the area. Historical accounts of severe storms in the Hampton Roads and Peninsula area date back several hundred years.

Views of the flooding caused by the March 1962 "Northeaster" in the City of Poquoson are shown in Figures 2 through 5.

2.4 Flood Protection Measures

There are no existing flood control structures that would provide protection during major floods in the study area. The "Uniform Statewide Building Code" which went into effect in September 1973 states, "where a structure is located in a 100-year flood plain, the lowest floor of all future construction or substantial improvement to an existing structure . . ., must be built at or above that level, except for non-residential structures which may be flood-proofed to that level." These requirements will no doubt be beneficial in reducing future flood damages in the community.

3.0 ENGINEERING METHODS

For coastal areas studied, standard hydrologic and hydraulic methods were used to determine the flood hazard data required for this study.

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Figure 2. Intersection of Poquoson Avenue and N. Lawson Road

Figure 3. Intersection of Ridge Road and Poquoson Avenue

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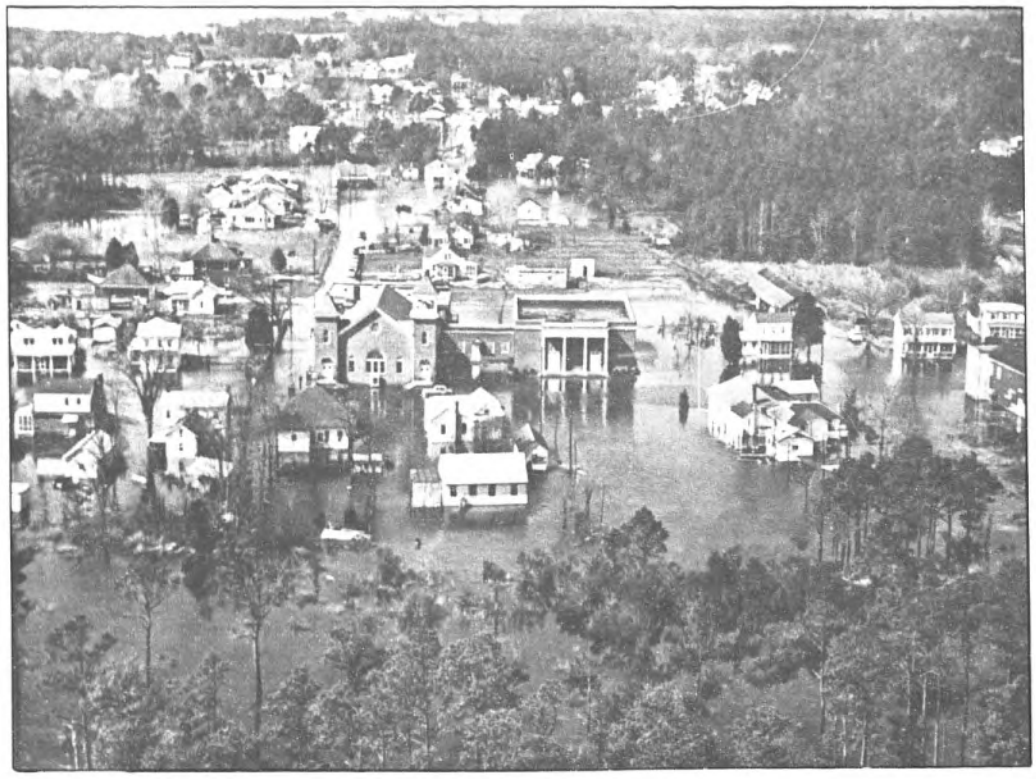

Figure 4. Intersection of Poquoson Avenue and Church Road

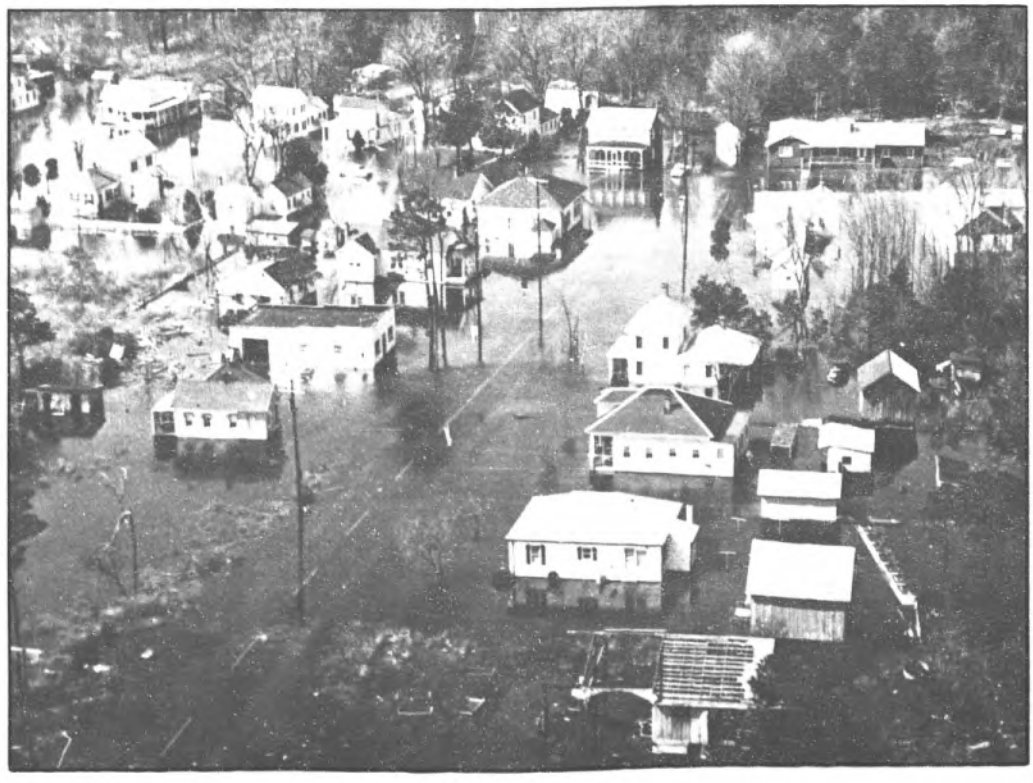

Figure 5. Intersection of Messick Road and Poquoson Avenue

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Floods having recurrence intervals of 10, 50, 100, and 500-years have been selected as having special significance for the land use and flood insurance applications of the flood insurance program. The analyses reported here reflect current conditions of the coastal areas.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish tidal-frequency relationships for floods of the selected recurrence intervals for the flooding source studied in detail in the City of Poquoson.

Tidal-frequency data were taken from previous reports (Reference 3 and 4) prepared by the Norfolk District, U. S. Army Corps of Engineers. Data in these reports were developed from extensive analyses of all the tidal-flood records in the area. Flood elevations for the various frequencies developed in these studies were deemed applicable for the City of Poquoson.

The tidal elevation-frequency curve for the City of Poquoson is is shown in Figure 6.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding source in the City of Poquoson were carried out to provide estimates of the elevations of floods of the selected recurrence intervals for the flooding source studied in detail.

The coastal high hazard area for the City of Pozuoson, Virginia, was determined by methods outlined in the "Guidelines for Identifying Coastal High Hazard Zones," (Reference 6). Based on these procedures, the minimum size wave capable of causing major storm damage to a conventional wood frame structure is three feet. The upper limit of the high hazard area, as defined by the effective water depth at which this three-foot wave will break, is the five-foot contour.

Poquoson is generally a low-lying peninsula surrounded by the Poquoson River to the north, Chesapeake Bay to the east, and Back River to the south. Under the assumed design storm conditions, a 3-foot wave can be produced and propogated across any of these waterways.

From a numerical standpoint, all of the peninsula lying below the 5-foot contour could be subjected to the design wave, and therefore considered in the coastal high hazard zone. However, in areas where

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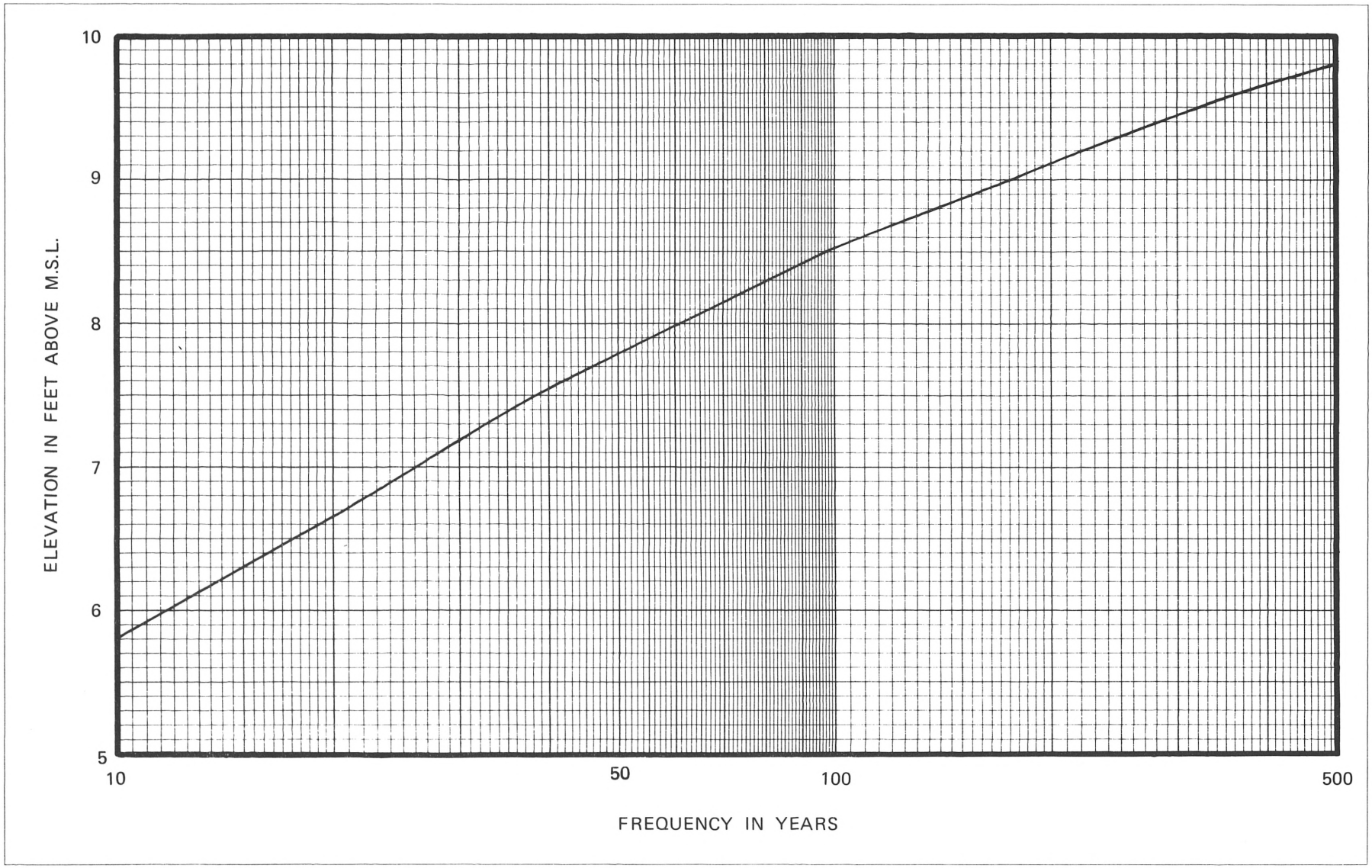

FIGURE 6

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF POQUOSON, VA
(INDEPENDENT CITY)

TIDAL ELEVATION-FREQUENCY CURVE

CHESAPEAKE BAY

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the topographic features result in the coastal flood zone extending a considerable distance inland, the travel distance and associated effects of the design wave could be influenced by other factors. Structures and dense vegetative cover tend to dissipaté wave energy as the wave passes across a coastal region. Therefore, even if interior structures lie below the numerically calculated upper limit of the high hazard area it is possible their exposure to direct wave attack is materially minimized or eliminated.

The Poquoson peninsula is characterized by extensive stands of tidal marsh and scrub brush. However, this vegetation offers little or no protection to interior regions when storms produce tidal flooding 8.5 feet above mean sea level. Thick stands of trees are also found at numerous locations within Poquoson, which do provide a protective barrier to many low-lying areas.

Based on the guidelines and considerations outlined above, the Coastal High Hazard Zone was determined as shown on the Flood Insurance Rate Maps.

All elevations are measured from mean sea level datum; elevation reference marks used in this study are shown on the separately printed Flood Insurance Rate Map.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures. For this Flood Insurance Study the Flood Insurance Rate Map has been used to indicate the flood boundaries.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year tidal flood has been adopted by the Federal Insurance Administration as the base flood for purposes of flood plain management measures. The 500-year tidal flood is employed to indicate additional areas of flood risk in the community.

The boundaries of the 100-year and 500-year tidal floods have been determined by utilizing available topographic data and field surveys. The area inundated by these tidal floods is shown on the Flood Insurance Rate Map, which is an enlargement and reproduction of portions

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of the seven and one-half minute United States Geological Survey Quadrangle Maps (Reference 1) entitled "Poquoson West, Virginia"; "Poquoson East, Virginia"; "Newport News North, Virginia" and "Hampton, Virginia." This map has a scale of one inch equals eight hundred feet with a contour interval of five feet. In cases where the 100-year and 500-year tidal flood boundaries are close together, only the 100-year tidal flood boundary has been shown.

Flood boundaries are indicated on the Flood Insurance Rate Map (Panel 04). On this map, the 100-year flood boundary corresponds to the boundary of the areas of special flood hazards (Zones A5 and V5); and the 500-year flood boundary corresponds to the boundary of areas of moderate flood hazards (Zone B).

Small areas within the flood boundaries may lie above the flood elevations and therefore not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Floodways are not applicable for tidal flood areas.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the Federal Insurance Administration has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for tidal flooding affecting the City of Poquoson.

5.1 Reach Determinations

Reaches are defined as flood-prone areas having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year tidal floods.

This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-year Floods	Variation
2 to 7 feet	1.0 foot

The entire City of Poquoson which is affected by tidal flooding has been designated as one reach.

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5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is the Federal Insurance Administration device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHF are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10-year and 100-year tidal floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10-year and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After determination of the single tidal reach and its respective Flood Hazard Factor, the entire incorporated City of Poquoson was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A5:	Special flood hazard areas inundated by the 100-year tidal flood, with base flood elevations determined and zone designations assigned according to the Flood Hazard Factor.
Zone V5:	Special Flood Hazard Areas along coasts inundated by the 100-year tidal flood, as determined by detailed methods, and that have additional hazards due to velocity (wave action); base flood elevations shown, and zones subdivided according to Flood Hazard Factors.
Zone B:	Area between Zones A5, V5, and the limits of the 500-year tidal flood.
Zone C:	Area not subject to flooding by the 500-year tidal flood.

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Table 1, "Flood Insurance Zone Data," summarizes the flood elevation differences, Flood Hazard Factors, flood insurance zones, and base flood elevations for tidal flooding studied in detail in the City of Poquoson.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Poquoson is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the Federal Insurance Administration.

6.0 OTHER STUDIES

A search was made for existing literature on the flood hazards in the City of Poquoson, Virginia. A Flood Plain Information Report for Poquoson, Virginia, was prepared by the United States Army Corps of Engineers in June 1971. In this report, 9.0 feet, referred to mean sea level datum, was used as the elevation of the 100-year tidal flood (Intermediate Regional Tidal Flood). Using 8.5 feet in the current FIS report is not a conflict in technical data, but due to rounding upward to the nearest even foot in the earlier report.

A Flood Plain Information Report for Hampton, Virginia, which borders the City of Poquoson on the south, was prepared by the United States Army Corps of Engineers in October 1968. Also, a Type 4 Flood Insurance Study for Hampton, Virginia, was prepared for the Federal Insurance Administration by the U. S. Army Corps of Engineers in October 1970. The tidal data contained in these reports are in agreement with this study.

7.0 LOCATION OF DATA

The supporting hydrologic and hydraulic data for this report are on file for five (5) years at the Norfolk District Office, United States Army Corps of Engineers, Norfolk, Virginia.

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE BETWEEN BASE FLOOD AND:[2]			FHF	ZONE	BASE FLOOD ELEVATION
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Tidal Area Reach 1	01,02,03,04, 05	-2.7	-0.7	+1.3	025	A5,V5	8.5'

[1] FLOOD INSURANCE RATE MAP PANEL
[2] WEIGHTED AVERAGE

TABLE 1

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF POQUOSON, VA
(INDEPENDENT CITY)

FLOOD INSURANCE ZONE DATA

TIDAL AREA

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8.0 BIBLIOGRAPHY AND REFERENCES

1. Maps - United States Department of Interior, Geological Survey Quadrangle Maps entitled "Poquoson West, Virginia;" Poquoson East, Virginia;" "Newport News North, Virginia" and "Hampton, Virginia."

2. Data Summary - York County, Division of State Planning and Community Affairs, 1010 James Madison Building, Richmond, Virginia, dated September 1971.

3. Flood Plain Information, Coastal Flooding, Town of Poquoson, Virginia, dated June 1971, prepared by the Norfolk District, U. S. Army Corps of Engineers, Flood Plain Management Services Branch, Engineering Division.

4. Flood Plain Information, Coastal Flooding, Hampton, Virginia, dated October 1968, prepared by the Norfolk District, U. S. Army Corps of Engineers, Flood Plain Management Services Branch, Engineering Division.

5. Flood Insurance Study, Hampton, Virginia, dated October 1970, prepared for the Federal Insurance Administration by the Norfolk District, U. S. Army Corps of Engineers, Flood Plain Management Services Branch, Engineering Division.

6. U. S. Army Corps of Engineers, Galveston District "Guidelines for Identifying Coastal High Hazard Zones," June 1975.

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ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (MSL)	DESCRIPTION OF LOCATION
RM 1	4.3	The reference mark is a drill hole in the top of the concrete curb near the intersection of Bayview Drive and Harbour Drive. It is located on the southwest side of Harbour Drive and about 15 feet west of the concrete drain inlet.
RM 2	4.1	The reference mark is a drill hole located in the northeast corner of a concrete drain inlet northwest of the intersection of Bayview Drive and Poquoson River Drive.
RM 3	10.3	The reference mark is a railroad spike in a power pole (VEPCO No. JE-76) located on Hunt's Neck Road about 400 feet southeast of the intersection of Hunt's Neck Road and Edwards Road. The spike is about 1 foot above the ground.
RM 4	8.7	The reference mark is a railroad spike in a power pole (VEPCO No. 533-8) located on Hunt's Neck Road about 250 feet northwest of Susan Drive. The spike is about 1 foot above the ground.
RM 5	9.5	The reference mark is a railroad spike in a power pole (VEPCO No. KC-76) located on Hunt's Neck Road about 25 feet northwest of the intersection of Hansom Drive and Hunt's Neck Road. The spike is about 1 foot above the ground.
RM 6	7.3	The reference mark is a railroad spike in a power pole (VEPCO No. 534-71) located at the intersection of Pasture Road and Wilson Drive. The spike is about 1 foot above the ground.
RM 7	7.0	The reference mark is a railroad spike in a power pole (VEPCO No. 534-31) located on Hunt's Neck Road about .3 mile south of Pasture Road at a small creek in the bend of the road. The spike is about 2 feet above the ground.
RM 8	7.8	The reference mark is a drill hole located in the southwest corner of the concrete floor of the Sewage Pumping Station located along Hunt's Neck Road about 200 feet north of Yorktown Road.
RM 9	10.1	The reference mark is a railroad spike in a power pole (VEPCO No. 494-63) located .25 mile south of Kelsor Road on Wythe Creek Road. The spike is about 18 inches above the ground.
RM 10	10.4	The reference mark is a railroad spike in a power pole (VEPCO No. 0B72) located on Wythe Creek Road about 100 feet south of Hudgins Road. The power pole is located between Sarah Hogge Seafood Restaurant and the 7-11 store. The railroad spike is about 1 foot above the ground.

ELEVATION REFERENCE MARKS

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF POQUOSON, VA
(INDEPENDENT CITY)

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ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (MSL)	DESCRIPTION OF LOCATION
RM 11	9.4	The reference mark is a drill hole located in the northwest corner of the concrete floor of the Sewage Pumping Station located on Little Florida Road about 200 feet east of Wythe Creek Road.
RM 12	8.55	The bench mark is located about .35 mile south along Wythe Creek Road from the intersection of Little Florida Road, to Oxford Run, about 20 feet south of Oxford Run and about 50 feet east of Wythe Creek Road, in the northwest corner and flush with the concrete floor of the Sewage Pumping Station (U.S.G.S. A266 Reset 1975).
RM 13	9.6	The reference mark is a railroad spike in a power pole (VEPCO No. 494-66B) located at the intersection of Whitehouse Circle and Poquoson Avenue. The spike is about 1 foot above the ground.
RM 14	11.667	The bench mark is about 300 feet south along Poquoson Avenue from the intersection of Odd Road, in the south face of the brick building, 1 foot east of the front door entrance, and 4.5 feet above the cement porch. The building is located at 777 Poquoson Avenue and now houses Poquoson Electronics (U.S.G.S. C 266 1942).
RM 15	7.7	The reference mark is a drill hole located in the south corner of the concrete floor of the Sewage Pumping Station located on Odd Road about 300 feet northeast of S. Terrace Drive.
RM 16	6.8	The reference mark is a railroad spike in a power pole (VEPCO No. UD11) located on Odd Road about 400 feet southwest of S. Terrace Drive. The spike is about 1 foot above the ground.
RM 17	5.5	The reference mark is a large nail in a power pole (VEPCO No. AE45) located on the west side of Cedar Road, 50 feet south of Municipal Drive. The nail is about 6 inches above the ground.
RM 18	5.73	The bench mark is a Corps of Engineers Survey Mark Disk set in concrete about one inch below ground surface, stamped "Tidal BM No. 5 1975 Norfolk District." The mark is 0.02 mile east along Virginia Route 172 from Poquoson Post Office to Cedar Road, 0.5 mile south along Cedar Road to the intersection with Little Florida Road, near the south boundary of 257 Little Florida Road, 24.5 feet north of the centerline of Little Florida Road, and 30 feet east of the centerline of Cedar Road.
RM 19	7.51	The bench mark is a Corps of Engineers Survey Mark Disk, stamped "Tidal BM No. 4 1975 Norfolk District." The mark is 0.02 mile east along Virginia Route 172 from Poquoson Post Office to Cedar Road, 1.05 miles south along Cedar Road to the Sewage Pumping Station, 1.5 feet east of the west edge and 0.9 foot north of the south edge and flush with the concrete floor of the Sewage Pumping Station.

ELEVATION REFERENCE MARKS

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ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION IN FT. (MSL)	DESCRIPTION OF LOCATION
RM 20	4.63	The bench mark is a Corps of Engineers Survey Mark Disk set in concrete about one inch below the ground surface, stamped "Tidal BM No. 3 1975 Norfolk District." The mark is 0.02 mile east along Virginia Route 172 from Poquoson Post Office to Cedar Road, 1.2 miles south along Cedar Road to the intersection with Canal Drive on the west side of Cedar Road back of curb, 67.9 feet south of VEPCO power pole DL-67 and 44.2 feet west of a 16 inch maple in the northwest corner of lot 231 Cedar Road.
RM 21	4.50	The bench mark is a Corps of Engineers Survey Mark Disk set in concrete about one inch below ground surface, stamped "Tidal BM No. 2 1975 Norfolk District." The mark is 0.02 mile east along Virginia Route 172 from Poquoson Post Office to Cedar Road, 1.5 miles south along Cedar Road to the intersection with Riverview Drive, back of the curb in the curved portion of the northeast corner of the streets, 25.3 feet west of VEPCO power pole EJ-11 and 17.5 feet south of VEPCO power pole EJ-41.
RM 22	4.85	The bench mark is a Corps of Engineers Survey Mark Disk set in concrete about one inch below ground surface, stamped "Tidal BM No. 1 1975 Norfolk District." The mark is 0.02 mile east along Virginia Route 172 from Poquoson Post Office to Cedar Road, 1.5 miles south along Cedar Road to the intersection with Riverview Drive and 239 feet east along Riverview Drive, 1/2 foot back of the north curb, and 1/2 foot east of a catch basin.
RM 23	11.070	The bench mark is located near the intersection of Poquoson Avenue and Poplar Road, at Poquoson High School, in the south face of the brick building, 30 feet east of the southwest corner, and about 5 feet above the ground (U.S.G.S. D 266 1942).
RM 24	7.5	The reference mark is a large nail in a power pole (VEPCO No. 475-48) located on the east side of Bunting Lane near Floyd Avenue between houses no. 33 and no. 37 Bunting Lane. The nail is about 8 inches above the ground.
RM 25	6.6	The reference mark is a large nail in a power pole (VEPCO No. JL69) located on the south side of Church Street at the intersection of Bunting Lane between houses 153 and 155 Church Street. The nail is about 1 foot above the ground.
RM 26	4.8	The reference mark is the top of a concrete monument located on the north side of Church Street at the intersection of Langley Street.
RM 27	9.154	The bench mark is located at the intersection of Poquoson Avenue and Church Street, at Trinity Methodist Church, in the east face of the building, 23.5 feet south of the northeast corner, and about 5 feet above the ground (U.S.G.S. F266 1942).

ELEVATION REFERENCE MARKS

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
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